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SCIENCE NEWS LETTER

TECHNOLOGY DEPT.

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • FEBRUARY 12, 1944

De-Mechanized Warfare

See Page 109

A SCIENCE SERVICE PUBLICATION

When the lights go on again in Grigoriopol

Three short years ago Grigoriopol was a thriving city of the Russian Ukraine. Today it is a scene of desolation . . . victim of ravaging Hitlerite hordes.

But some day—soon we hope—lights will go on again in Grigoriopol, and in other Allied cities now under the Nazi heel.

When that time comes . . . thanks to a new idea in modern warfare . . . emergency electric power will be available to revitalize industries in war torn cities—immediately after they are retaken from the enemy.

This new idea—a self-contained POWER-TRAIN—has now been made a reality by the engineering brains and skill of Westinghouse.

Ten of these POWER-TRAINS are now being built by Westinghouse for use by the United Nations . . . each a complete 5000 kw power house on wheels, big enough to serve a community of 15,000.

Each POWER-TRAIN consists of 8 cars. Ingeniously assembled in these cars are: a 5000 kw steam turbo-generator, boilers, power stokers, boiler feed pumps, air-cooled condensers, auxiliary Diesel engine, living quarters for the crew —even conveyer equipment for handling coal which will be mined locally for fuel.

Because cooling water is not always available, air-cooled condensers are used to recover, as water, a high percentage of the exhaust steam from the turbine.

From switchgear to turbo-generator, each POWER-TRAIN is a complete 5000 kw mobile power house, ready to go to work at a few hours' notice . . . *in sub-zero cold or tropical heat of the desert.*

And remember—the same Westinghouse engineering brains and skill that developed the POWER-TRAIN will be available, after Victory, to create and build better products for you.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pennsylvania.

Tune in John Charles Thomas, NBC, Sundays, 2:30 p.m., E.W.T.

Westinghouse

Plants in 25 Cities Offices Everywhere

MEDICINE

Raising Blood Donations

Return of red blood cells to plasma donors would make possible 800% increase in plasma for armed forces through weekly contributions.

➤ DONORS of blood plasma to the armed forces via the American Red Cross program may in the future be able to give their blood every week instead of only once in two months as at present.

They could do this because after each donation they would get back their red blood cells after separation from the plasma.

As a result, 800% more plasma would be available for the armed forces, or the entire amount needed for military use in a year could be donated by about 120,000 instead of some 832,000 donors. (*Journal, American Medical Association,* Feb. 5)

The report telling of these possibilities covers studies at the New York University College of Medicine and the Sheepshead Bay, N. Y., laboratories of the U. S. Public Health Service, by Dr. Co Tui, Dr. F. C. Bartter, Dr. A. M. Wright, and Dr. R. B. Holt, with the technical assistance of Ina Ho and Nancy Baldwin. Electrophoretic studies were done in the laboratory of Dr. J. W. Williams, University of Wisconsin, by Dr. Mary L. Peterman, Dr. Margaret Bender and Miss Martha Blake Goodloe.

With the present blood-donation system, only the plasma is used and the red blood cells are discarded. This, the scientists calculate, means a waste of 825,000 pounds of human hemoglobin and more than 413 pounds of iron in the 5,000,000 units of plasma required by the armed forces this year.

The interval between blood donations now considered safe for the donor is based on the rate of regeneration of hemoglobin, red coloring matter and oxygen carrier of the blood. The total protein lost by each donor with each donation of a pint of blood is slightly over three ounces. If the red cells are reinfused into his veins, he is spared 80% of this drain and theoretically should be able to donate plasma five times as frequently as the present practice of once every eight weeks.

The effect of returning the red blood cells to the donors was tried on six volunteers. One of these gave three and two gave four full-sized blood donations in one week. The other three gave full-sized donations every week, one of them for nine and the other two for 12 weeks.

The plasma protein returned to normal within 48 hours after reinfusion of the red blood cells after each donation. Tests showed normal condition of the blood in other respects also.

For the immediate future, the doctors advise adopting the practice of reinfusion of the red cells to donors after each donation in regions where there is malnutrition among the donating population or where a large proportion of donors are women. This might be of practical advantage if it becomes necessary to establish blood banks in European countries for populations freed from the Nazis.

Shortening the interval between donations to one week is not advised, however, until further studies have been made. Such a short interval might cause a change in disease-resisting factors in the donor's blood which would be unfavorable to him and also might make his plasma less effective in helping the recipient to recovery. Further investigations along this line are projected.

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MEDICINE

Suction Machine Made From Two Bicycle Pumps

➤ HOW TWO bicycle pumps operating in reverse were made to substitute for an important but temporarily missing piece of operating-room equipment in a U. S. Army hospital in England is told by the War Department as an example of the resourcefulness of medical officers of the U. S. Army.

The missing equipment was the suction machine needed in many operations to keep the field of operation clear of blood and other fluid so the surgeon can see the tissues he is working on. This and other pieces of medical equipment and machinery were not immediately available when one of our Army hospitals was set up in England.

When several other makeshifts failed, Capt. Stanley Erpf, of the hospital's staff, went to shops in nearby towns and bought two bicycle pumps, rubber tire cement, the grip from a bicycle handlebar, and an assortment of nuts, bolts, washers and rubber, glass and copper tubing.

The washers in the bicycle pumps were reversed, so that air was drawn into the cylinder instead of being expelled. The two pumps were connected by tubing, and made to work together, forming a reciprocating type pump. By moving the bicycle grip back and forth rapidly, a vacuum is created in the infusion bottle. The force of this vacuum draws air through the tube that extends to the operating table, and any fluid getting in the way of the surgeon is drawn into the bottle.

Dr. Erpf's amused colleagues dubbed his gadget "Erpf's Folly" while he was assembling it. The captain had the last laugh, however, for the device worked and proved its value many times in the months before an electrically operated suction machine arrived. The hand-operated, homemade apparatus is still kept in good condition in case of emergency need.

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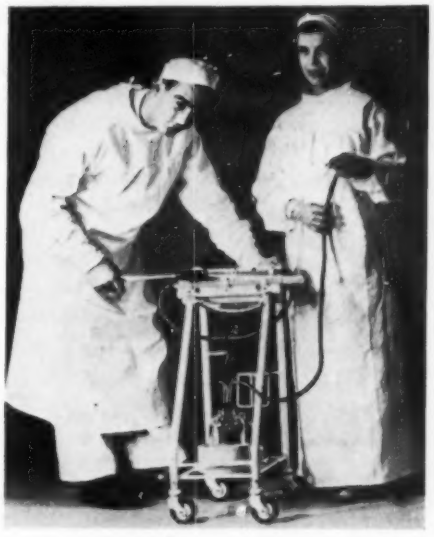

ERPF'S FOLLY — This homemade, hand-operated suction machine was made from bicycle pumps when the regular piece of necessary operating-room equipment had not arrived at a hospital in England. This official U. S. Army photograph shows the ingenious device designed and built by Capt. Stanley Erpf of San Francisco, on the staff of the hospital.

MEDICINE

Blood-Producing Vitamins

Riboflavin and the pellagra-preventive niacin are found to play a part in the manufacture and regeneration of the blood in the animal body.

➤ AT LEAST two vitamins of the B complex group, riboflavin and the pellagra-preventive niacin, appear to be factors necessary for the production and regeneration of the blood in the animal body, according to reports by two groups of scientists. (*Journal of Biological Chemistry*)

A stunting of the red blood cells that are constantly being produced by the blood-forming organs, and a consequent mild anemia, result from a synthetic diet containing all the known essential nutrients except riboflavin, Dr. C. A. Elvehjem and his associates of the University of Wisconsin found. This anemia, produced in dogs, is a direct result of the riboflavin deficiency and readily responds to a corrected diet containing adequate amounts of riboflavin.

Riboflavin is indispensable for normal growth and development. The results of these experiments therefore "suggest that in growing dogs there is a competitive need for riboflavin for growth and hemoglobin production."

It has also been suspected for some time that anemia, at least as found in pellagrins, is in some way associated with niacin deficiency. Dr. Philip Handler and Dr. William P. Featherston, of Duke University School of Medicine, show, apparently for the first time, that the anemia in pellagrous dogs is specifically due to this deficiency and can be corrected only by the administration of adequate amounts of this vitamin. The red blood cells in this anemia are large but below normal in number and hemoglobin content.

The dietary and other factors that are known to be involved or helpful in the production of blood cells in the body, such as iron, protein, glucose, hemoglobin, the anti-pernicious anemia factor of liver extract, xanthopterin and excessive amounts of cobalt, were without effect when administered to the pellagrous and anemic animals. They were successfully treated, however, with niacin.

Mature red blood corpuscles are not true cells since they do not have nuclei. In the early formative stages, however, they do have nuclei. It is the theory of the Duke physiologists that niacin is necessary for the proper production and maturation of these blood cells. This vitamin is known to play an important role in the respiration of all cells of the body. The lifetime of blood cells appears to be very short and the rate of turnover is quite rapid. Consequently the requirements of niacin for the manufacture of blood cells might be correspondingly great. A niacin deficiency, besides producing the usual symptoms of pellagra, might also lead to anemia because of the inadequate supply of this vitamin for development of the red blood cells in the early stages.

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CHEMISTRY

Plastic Car Tires

➤ PLASTIC TIRES for automobiles may take a place side by side with natural and synthetic rubber tires in post-war days. The same new plastic is suitable for making garden hose so light that the wife may drag it around with ease as she waters the lawn, her feet being protected from dampness at the same time by shoes with soles and heels of the same material. These and many other uses are possibilities of a new plastic recently developed in the Goodyear Research Laboratory.

An automobile tire made of this new plastic stood up well in an 8,000-mile road test. During these tests the carcass and treads of the tire reached maximum temperatures only slightly higher than those reached in tires of natural rubber, and much below that developed in tires of the Buna S type of synthetic rubber. The tire was made with the standard equipment used to make natural rubber tires. The plastic can be handled in hot molds like natural rubber. It is claimed to be the first elastic plastic capable of being vulcanized during molding operations. Unlike natural rubber, this plastic is not affected by the rays of the sun.

The basis of this new plastic is a copolymer of vinylidine chloride and vinyl chloride. There are a great number of so-called vinyl plastics now in use. The starting point of them all is ethylene obtained from petroleum. By chemical reaction vinyl chloride, vinyl acetate or other vinyl compounds are obtained from the ethylene. By another process some of them may be polymerized; this means that their vinyl molecules may be put together to form giant molecules not un-

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like those of natural or synthetic rubber.

In the manufacture of this new plastic, which may become a successful rubber substitute in tires, the polymer is mixed with a plasticizing agent in the usual way, but with a curing agent added which makes vulcanizing possible. It then has twice the tensile strength of the uncured product.

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PHYSICS

Pitch Radioed at Night

Pure A above middle C may now be checked in evening with the 2,500 kilocycles per second frequency broadcast service of the National Bureau of Standards.

➤ MUSICIANS and manufacturers who want to check pitch can now tune in during the night with their shortwave sets to 2,500 kilocycles and get a musical sound guaranteed by the National Bureau of Standards to be pure 440 cycles per second, which is A above middle C in the musical scale. This radio frequency, 2,500 kilocycles per second, at night, is an addition, effective since Feb. 1, to the standard frequency broadcast service of the Bureau.

Since the same date, the pulse on the 59th second of every minute has been omitted. This government service, continuous day and night, broadcasts standard frequencies and standard time intervals from the Bureau's radio station near Washington, WWV. It makes the national standard of frequency widely available. This is of value in scientific and other measurements requiring an accurate frequency.

The Bureau's standard frequency broadcast service includes standard radio frequencies, standard time intervals accurately synchronized with basic time signals, standard audio frequencies and standard musical pitch.

At least three radio carrier frequencies will now be on the air at all times to insure reliable coverage of the United States and other parts of the world. Two frequencies, 5,000 and 10,000 kilocycles per second, are on continuously day and night. A 15,000 kilocycles-per-second frequency is on the air from 7:00 a.m. to 7:00 p.m., with the additional frequency to be used, 2,500 kilocycles per second, from 7:00 p.m. to 9:00 a.m.

Two standard audio frequencies, 440 cycles per second and 4,000 cycles per second, are broadcast on the radio frequencies of 5,000, 10,000 and 15,000 kilocycles. The audio frequency 440 cycles only is broadcast on the 2,500 kilocycles. The 440 cycles per second is the standard musical pitch; the 4,000 cycles per second is a useful standard audio frequency for laboratory measurements.

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ARCTIC OIL—To help supply oil and gasoline for the U. S. and Canadian armed forces in the Alaskan zone, oil wells such as the one shown above, are being tapped at Fort Norman, 125 miles south of the Arctic Circle on the Mackenzie River. The joint U. S. and Canadian government development is known as the Canol project, Canol standing for Canadian Oil.

ASTRONOMY

Star "Playing Catch"

Appears to be tossing part of its own atmosphere far out into space, clear around its companion, and recovering some of the flaming gases on its return trip.

➤ A STAR that appears to be "playing catch" with itself, tossing a part of its own flaming atmosphere far out into space, clear around its companion in a double-star team and recovering part of it on its return trip, is described by Dr. Otto Struve of the Yerkes Observatory.

The star is a rather faint double one, designated by astronomers as SX Cassiopeiae. Cassiopeia is the constellation landmarked by the great W-shaped group of stars on the opposite side of the Pole Star from the Great Dipper.

As Dr. Struve pictures the phenomenon, a stream of gas issues from one member of the double-star team and divides on the far side of the second member. Part of the stream flows off into space, while part circles around the second star and returns to rejoin the atmosphere of its parent star. Some tenuous, absorbing cloud of gases acting in this manner would explain the peculiar variations observed in the case of SX Cassiopeiae, Dr. Struve states. (*Astrophysical Journal,* January)

A powerful stream of cool but rapidly moving gas flows out from the G star toward its companion. One part of the stream, presumably composed of the more distant or more rapid strata, expands outward and leaves the system. The other part flows around the A star, and having become hotter, but traveling more slowly, ultimately returns to the G-type star, Dr. Struve believes. It is not possible to see this streaming action, but spectroscopic studies make this the most plausible picture.

The stream of ionized metals such as calcium and iron flows at a height above the surface of the A star about equal to the star's diameter.

"The most interesting feature of SX Cassiopeiae is the observation of an approaching shell at and near secondary eclipse," the Yerkes director states. "These motions are plausibly attributed to the turning over of the stream due to conservation of angular motion. Only a part of the stream is retained by the system and completes the entire circuit around the A star."

The spectrum of this eclipsing double star is a blend of a true star of the G type, to which class the sun belongs, and lines of another origin which re-

semble the shell lines of an A star, a type which has much hydrogen in its make-up.

The giant G-type star, which ejects the stream of gas, is believed to be larger than the luminous A-type star. The relative masses of the two, however, have not as yet been determined. The A star is completely eclipsed once every 36.567 days, giving a chance to study the G star directly. But the streams of gas from the G star are projected upon the disk of the bright A star, so that a clear view of it is never realized for study.

That SX Cassiopeiae was not just a simple system of two eclipsing stars was discovered by Mme. L. Ceraski at Moscow in 1907. Peculiar variations in the star's velocity curve were observed by A. H. Joy at Mount Wilson Observatory. These, Dr. Struve believes, are probably due to changes in the density of the gas within the streams.

"The entire picture is very similar to that observed in Beta Lyrae," he states, "only here the smaller, and probably less massive star, is the bright A-type component."

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HUMAN GUINEA PIGS—In laboratory rooms simulating all kinds of weather — arctic blizzards, tropical rains, searing desert heats—various kinds of clothing for soldiers are tested by the U.S. Army Quartermaster Corps. Under the piece of clothing being tested, the volunteer wears an electronic contact harness, like the one on the man to the right, which constantly checks the temperatures of eight vital parts of his body.

PHYSICS

"Topography" of Crystals

Surface irregularities which are only a few molecules in depth are revealed by new photographic technique, in which two surfaces are silvered.

➤ THE UPS and downs, that is the topography, of an apparently flat crystal surface are revealed with startling clearness and highly increased accuracy by a new photographic technique making use of the interference of light. Differences in level as small as 1/5,000,000 inch, a step only a few molecules in height, can be detected.

The new technique is the work of S. Tolansky of the physics department of the University of Manchester, England, and is described in the British scientific journal, *Nature*. (Dec. 18, 1943)

An optical flat of high precision is brought very close to the crystal surface to be investigated. Such a flat is a piece of glass one surface of which has been ground and polished until it is as nearly as possible a perfectly plane surface. Both the surface of the crystal and that of the flat have been coated previously with a thin semi-transparent layer of silver, electrically deposited in a vacuum. The surfaces are then illuminated with the green light from a mercury arc lamp. This light is monochromatic—consists of only one wavelength.

The surfaces, as seen by the light reflected from them, do not appear of a uniform green tint. Instead, a pattern of light and dark bands appears. These are known as interference fringes, and are due to the alternate interference and reinforcement of light. In some places the light reflected from the surface of the crystal, the farther surface, combines with the light reflected from the optical flat, the nearer surface, in such a way that the crests of one wave stream fall into the troughs of the other wave stream. This is interference. They annul each other and a dark band results.

Nearby, on either side, where the distance between the two surfaces is greater or less by one-half wavelength of the light used, the two reflected rays combine crest to crest, and a bright band results. The iridescent colors of very thin films, such as those shown by an oil spot on the pavement, are similarly due to the interference of light reflected from the upper and lower surfaces of the film.

Assuming the glass surface to be perfectly flat, the interference fringes thus show the ups and downs of the crystal surface. They are the contour lines of a topographical map of the surface, the distance from one bright fringe to the next corresponding to a change in level of one wavelength of the light used. For the green mercury light, this is about 1/50,000 inch.

This interference method has long been used for the testing of flat surfaces. What is new in the present technique is the silvering of the two surfaces—apparently a very small change, but it makes a whale of a difference.

Without the silvering, the fringes are broad and hazy, and it is impossible to measure from the estimated center of one fringe to that of the next with any great accuracy. With the silvering, the bright fringes are reduced to thin sharp lines with wide dark spaces between them, just like the thin sharp lines used on any topographical map. Measurement is easy and accurate.

By silvering the surfaces, their reflecting powers are increased to the extent that 85% of the light is reflected, only 15% transmitted. The consequence is that the light is reflected back and forth between the two surfaces many times before it emerges, and interference predominates over reinforcement.

Examined by the new method, the surface of mica is seen to consist of rounded humps and hollows. The contour lines are smooth and rounded like those of a sand dune country. The surface of selenite, on the other hand, is seen to consist of ragged ridges all running in the same general direction, resembling a plowed field.

A very important use of the new method is to disclose the cleavage lines on a crystal surface. These are abrupt steps, tiny nearly vertical cliffs, like the much larger cliffs that geologists call

"faults" in an earthly landscape. They are disclosed in the same way, by breaks in the contour lines. So great is the accuracy of the new method that cleavage steps only 1/5,000,000 inch in height can be detected. This amounts to only a few molecules.

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ASTRONOMY

Nova Is Now Egg-Shaped

Discovery that a star, which greatly increased in brilliance several years ago, has become elongated, may have some bearing on origin of our solar system.

➤ DISCOVERY that a star, which greatly increased in brightness a number of years ago because of an internal explosion, has become egg-shaped may bring us closer to the secret of the origin of our solar system.

A cable received at the Harvard College Observatory from Dr. J. S. Paraskevopoulos, superintendent of Harvard's Southern Astronomical Station, stated that the old nova in the southern constellation of Pictor, the Painter's Easel, is decidedly elongated. This nova brightened to a magnitude of 1.2 in 1925.

Photographs made with the 60-inch Rockefeller reflector at Bloemfontein, South Africa, fail to show the usual haze, which normally surrounds many of the novae.

Revolutionary phenomena similar to those observed for the famous Nova Herculis of 1934 and Nova Persei of 1901 have apparently taken place within Nova Pictoris. These explosive phenomena may be linked with the evolution of planetary nebulae, but there is at yet no good evidence that they are connected with the evolution of planetary systems.

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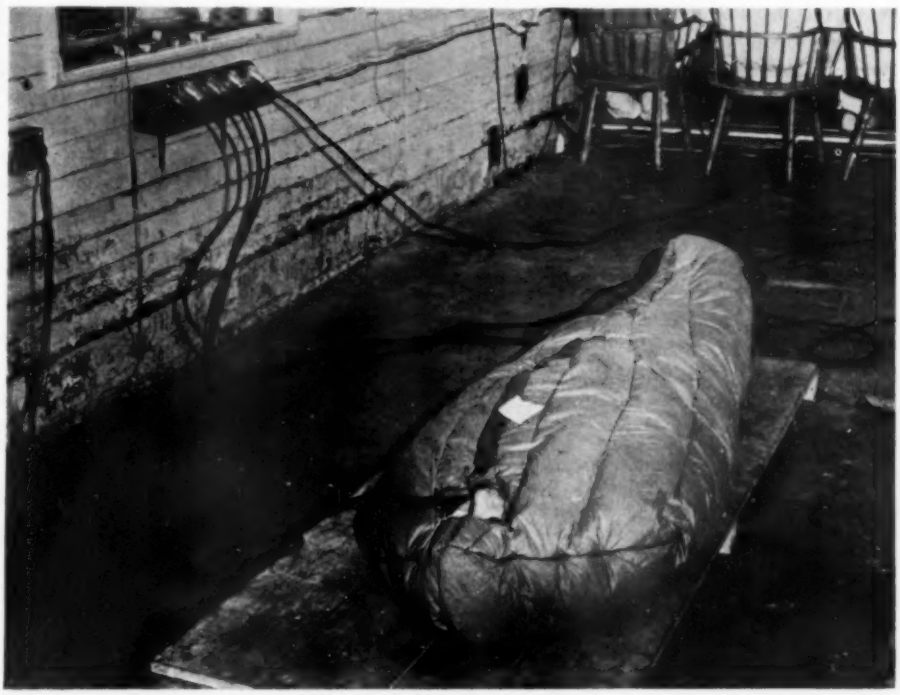

***NOT A MUMMY!**—If you look closely you can see part of the face of a sleeping soldier volunteer in this picture. He is being exposed to 40 to 60 degrees below zero temperatures for testing the effectiveness of an Army sleeping bag. Under the bag he is wearing the electronic harness, developed by the Quartermaster Corps and Minneapolis-Honeywell's Brown Instrument Division, shown on the facing page. This has a heavy cable carrying impulses to an instrument board.*

MEDICINE

Late Syphilis Skin Sore Cured by Penicillin

➤ PENICILLIN, already reported apparently effective in curing early syphilis, has now been tried in a case of late syphilis with "striking" results clinically, Dr. P. A. O'Leary and Dr. W. E. Herrell, of the Mayo Clinic report.

The disfiguring syphilitic condition of the skin over the entire nose showed improvement within eight days and cleared up, except for slight pigmentation, three weeks after the penicillin treatment was completed. It had previously been treated by local measures for eight months without improvement.

In spite of the "outstanding" clinical result, the blood and spinal fluid tests remained positive for syphilis. Further treatment may be necessary to change this. At least five years of observation will be necessary, the doctors state, to determine whether the results of treatment are permanent.

The patient was a 42-year-old married woman who had never been pregnant, did not know she had syphilis, and except for the skin affliction had no clinical signs of syphilis.

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INVENTION

Rubber-Wrapped Eggs May Be Sold by the Yard

➤ ONE of these days when you order a dozen fresh eggs, you may be surprised to see your dealer haul them up in a yard-long string, all linked together like sausages. This will be Albert B. Clunan's invention in operation; the "casing" will be one of the already well-known rubber wrapping films, sealed around each egg to exclude the staleness-causing air.

The sealing-in machine on which Mr. Clunan, a resident of Barberton, Ohio, obtained his patent, No. 2,340,260, is quite simple. The rubber film is led off a roll and through a U-shaped trough, where the eggs are put in place. At the end of the trough a pair of tubes deliver blasts of hot air, softening the film to the sticking-point. Immediately thereafter it passes between two rollers of soft sponge rubber, which press it firmly about the eggs and stick it to itself in the spaces between.

Rights in the patent are assigned to the Wingfoot Corporation, of Akron.

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MEDICINE

Transparent Plastic Used To Preserve Human Tissues

➤ HUMAN TISSUES, including small organs and embryos, can be preserved in a transparent plastic of the type used to replace glass in airplanes and many more familiar household objects. Details of this new method of preparing permanent, practically unbreakable specimens for study and museum exhibit are reported by Dr. Max M. Strumia and Dr. J. Ivan Hershey, of Bryn Mawr Hospital. (*Science*, Feb. 4)

The original size, shape and texture are kept "to a remarkable degree," the scientists state, and the color, though less brilliant than originally, may also be satisfactorily preserved.

The specimen to be preserved is first dehydrated at freezing temperatures and then saturated under vacuum with the liquid acrylic ester (monomeric ethyl methacrylate). Final steps consist in polymerization and, if desired, cutting and polishing the block for a more finished product.

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PSYCHOLOGY

Children Should Not Be Encouraged in War Games

➤ A-A-A-A-A-A-A-A! Bang! B-r-r-r-r-r! If the children in your block are constantly sounding off with these imitations of machine guns, bombs, hand grenades and other instruments of death, they should be encouraged instead to take a real part in the war effort by collecting scrap or buying war stamps. This is the judgment of Dr. Arthur L. Rautman, psychologist for the Sioux City Public Schools, Sioux City, Iowa.

While war games are natural enough in wartime and should not be forbidden, Dr. Rautman says in *Mental Hygiene*, neither should such play be encouraged. When a child is preoccupied with war games, it indicates an unhealthy state of mind and considerable worry on the part of the child because of the war.

Giving the child war toys won't help him to get rid of his worry. It may make it worse by reminding him constantly of war games even when he would otherwise not be preoccupied with them. Instead of a painted tommy gun that is always a tommy gun and nothing else, give him a neutral object like a set of blocks which can be in turn a fort, a locomotive, a gun or just a house, Dr. Rautman advises. Such toys will not restrict him, but will give him a chance to widen his interests.

Participation in war stamp drives or the collection of newspapers will not only give the child release for the tension that makes him play war games, but will at the same time make him feel that he is doing something considered useful and valuable not only by himself but by the whole community. It gives him a genuine part in fighting the real war.

Don't forbid war games, Dr. Rautman counsels. It would be ineffectual, and it would add a sense of guilt to the disturbing fears the child already has. What parents and other adults need to do is to relieve the child's fears by giving him as much security as possible and providing him with realistic information about the war and the way it affects him. Such information should be presented unemotionally and should be adjusted to his understanding.

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MEDICINE

Bread-Mold Preventive Cures Athlete's Foot

➤ SODIUM PROPIONATE, a chemical now being used by many large baking companies to check the growth of mold in bread and cake, is an effective remedy for athlete's foot, ringworm and many other fungous infections, Dr. Edmund L. Keeney, of Baltimore, and Comdr. Edwin N. Broyles, of the Johns Hopkins Medical School now serving in the Navy, report. (*Bulletin of the Johns Hopkins Hospital*)

The chemical is used in an ointment, as a powder and in a solution.

Some of the 55 midshipmen at the U. S. Naval Academy who used the chemical for athlete's foot were cured in four weeks. After 20 weeks of treatment, fungous material was found in scrapings from the feet of only three of the men.

The remedy was equally effective in patients with ringworm of the scalp and of the skin, fungous infections of the ear, thrush and blacktongue due to a fungus.

Besides the 90 patients reported on, an additional 376 have been treated with sodium propionate in ointment, powder or solution, without any sign of irritation from its constant use. A contact dermatitis developed in one patient after four days of treatment.

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IN SCIEN

GEOLOGY

Four-Pound Meteorite Discovered by Accident

➤ A FOUR-POUND meteorite has been discovered quite by accident in a farmhouse yard in the northern part of Cowley County, Kansas. While serving as field representative for an oil company, H. H. Nininger, of the American Meteorite Laboratory, found the stony specimen.

"While pumping a drink, I was, as always, scanning the premises for odd-looking stones," Mr. Nininger reports. (*Popular Astronomy*, January) "Under some plum bushes a few steps away I noticed a rusty-looking chunk of rock about the size of my two fists and at once decided that it needed investigation. I stepped over and picked up the rock, which was evidently a badly weathered stony meteorite (an aerolite)."

Students of meteorites seldom have the good fortune to stumble upon a meteorite in the field. This specimen represents a completely new find. No other meteorite has been reported from any point nearer than 50 miles, and the stone is recognized as belonging to a different fall from those.

Meteorites are classified roughly as stone and iron. Iron specimens are more numerous in museums because they are more easily identified. Many more stones than irons, however, have been seen to fall.

Science News Letter, February 12, 1944

GENERAL SCIENCE

Mexico Plans Expansion Of Polytechnic Institute

➤ AN EXPANSION of research and teaching programs in science and technology is being planned for the Polytechnic Institute in Mexico City by Dr. Manuel Sandoval Vallarta, who has just been made the new head of this government technical university.

Formerly professor of physics at the Massachusetts Institute of Technology, Dr. Vallarta returned to his native Mexico to head the wartime government commission on scientific investigation, and he now has been given new responsibilities.

Science News Letter, February 12, 1944

E FIELDS

MEDICINE

Anti-Thyroid Medicine Helps at High Altitudes

➤ DISCOVERY that an anti-thyroid medicine will increase resistance to the lack of oxygen at high altitudes, at least for rats, is announced by Dr. Albert S. Gordon, Dr. E. D. Goldsmith and Dr. Harry A. Charipper, of New York University. (*Science*, Feb. 4)

The anti-thyroid medicine is thiourea, recently found effective in treating humans suffering from overactivity of the thyroid gland. Thiourea, it has been found, interferes with the production of normal thyroid hormone by the gland.

When this medicine was given to rats for 12 or more days, they were able to survive at low atmospheric pressure comparable to that at an altitude of 32,000 feet, whereas the majority of untreated animals succumbed. The thyroid glands of the treated animals became enlarged, as a result of the treatment, but this condition rapidly returned to normal when the medicine was stopped. The enlargement of the gland indicated a condition of underactivity of the thyroid which the scientists believe is responsible for the animals' ability to stand reduced atmospheric pressures, or simulated high altitudes.

Whether these findings can be used to increase altitude tolerance for flying personnel is not stated in the report.

Science News Letter, February 12, 1944

PUBLIC HEALTH

Reading Glasses May Not Be Right for War Work

➤ SOME of the older men and women who are working in war plants may be having trouble with their eyes that could be corrected by properly prescribed eyeglasses. The glasses which many of these older persons wear for reading the newspaper or sewing may not help at all on the job, because the distance from the eye to the job is different from that for which the "reading" glasses were prescribed.

The same difficulty may be giving trouble to younger workers who have worn eyeglasses before but are now doing a different kind of work with different eye-to-job distance. If you go to your eye doctor because your eyes have been bothering you or you have been having headaches or getting unduly tired, it would be a good idea to tell him about the new job, so he can consider this factor in prescribing glasses for you.

When prescription lenses are put into protective goggles, special care is necessary to see that the lenses are set and kept in the correct position. Otherwise much harm may be done. If, for example, the lens is turned slightly in the frame, instead of correcting the error in vision, it might double it.

Goggles to protect the eyes of workers from dust, fumes, glare, flying particles and the like are important. About 95% of injuries to the eyesight of workers can be prevented, it has been estimated, if the worker is provided with and wears consistently the goggles or other eye-protecting equipment suited for his work.

Good sanitary conditions of workplace and washrooms are also important for protecting eyesight, because such conditions cut down chances of infection.

Science News Letter, February 12, 1944

CHEMISTRY

Identifying Textiles Aids Collection of Clothing

➤ IDENTIFYING textiles aids the collection of discarded clothing and rags for use of war sufferers of liberated nations.

Kits have been prepared which enable anyone to tell whether a piece of material is cotton, wool or made from another natural or artificial fiber, or if it is woven from several different fibers.

When white material is boiled in the dye (and color remover is included in the kit in case the fabric has already been dyed), various materials take on characteristic colors. After immersion in the dye bath, wool will appear brown. Cotton will turn green and silk a greenish black. Pieces of rayon will become a greenish-blue; acetate, bright orange; aralac, black; and nylon, a dull red.

These kits, which are made available by Science Service, make it possible for everyone to identify material by testing a sample. Even a small piece snipped from the seam of a dress or suit can be used.

The Textile Identification Unit of THINGS of science can be secured by sending 50c to SCIENCE NEWS LETTER, 1719 N Street, N.W., Washington 6, D. C., and asking for unit No. 39.

Science News Letter, February 12, 1944

METALLURGY

Aluminum to Be Available For Post-War Experiments

➤ SMALL AMOUNTS of aluminum are to be released for post-war experiments by the War Production Board. Under the new policy, the Aluminum and Magnesium Division will approve requests for a little of the light metal for experiments, provided manpower, technical skills or facilities are not diverted thereby from activities connected with the war effort.

Requests for allocations of aluminum for experiments to work out models for civilian goods after the cessation of hostilities have been refused in the past.

Science News Letter, February 12, 1944

AERONAUTICS

Electrical Gyroscopes Now Used on Airplanes

➤ ELECTRICALLY driven gyroscopes are now used on airplanes. These rapidly rotating wheels help the pilot maintain a straight and level course. Without gyroscopic flight instruments a pilot might fly in circles or in strangely tilted positions and not realize it, declared H. M. Witherow of the General Electric Company at the New York meeting of the American Institute of Electrical Engineers.

Airplanes, he said, are equipped with a directional gyroscope and a bank-and-climb gyroscope. How these two types are used on an automatic pilot was described by Albert Hansen, Jr., of the same company. The automatic pilot can take over the control of a plane and maintain the course set by the human pilot, he stated.

"Any pitch, roll or yaw—that is, lengthwise or crosswise tilt or turn—produces an electric signal in the automatic pilot," he said. "This signal is amplified and converted into mechanical power which moves elevators, ailerons and rudder to bring the airplane back to its correct" behavior and course.

The gyroscopic rotating mechanism in the electrically driven gyroscope is brought up to speed by a motor which may spin at some 12,000 revolutions a minute. Electric drive is preferred by many because the mechanism may be sealed in cases to prevent the entrance of gritty dust found over sandy deserts and other battle areas. Air-driven directional and horizon gyros have been used in airplanes for several years.

Science News Letter, February 12, 1944

MEDICINE

Teaching War Deaf and Blind

Special centers are in operation to give soldiers training, together with treatment, which will aid them in getting along successfully despite their handicap.

By MARJORIE VAN DE WATER

➤ RETURNING soldiers who have been blinded by the flames and steel of war or deafened by its terrible din are going to school to learn how to be useful and happy despite their wounds.

The Army is operating several special centers located strategically over the country to provide the best possible medical and surgical care, combined with this instruction, for these specially wounded men. Plans are under way for research into the problems of deafness so as to provide for even better treatment.

This is how the system, already in smooth operation, works. When returning wounded men reach this country they go to a receiving hospital. There they are sorted out, according to the types of wounds. If a man has been wholly or partly deafened, regardless of whether he has received other kinds of wounds or not, he is eligible to go to one of the three centers maintained for the deafened. He is usually sent to the one located nearest to his home and family.

The three centers for the deaf are at the Deshon General Hospital, Butler, Pa., Borden General Hospital, Chickasha, Okla., and Hoff General Hospital, Santa Barbara, Calif. Each one is equipped with sound-proof rooms and apparatus for recording speech and for the elaborate testing of hearing difficulties. Each has in attendance experts in hearing difficulties. At these centers, also, there is full provision for all the necessary medical and surgical care for restoring the soldier to complete health, aside from his hearing difficulties.

First, the soldier is tested. The experts learn not only the extent of his hearing deficiency, but also what sort of deficiency it is—whether in one ear or both, what sound pitches are not heard, and so on. This is much more thorough than would be possible in an ordinary hospital. It is done with recordings of actual speech, as well as the usual audiometer tests. Next various hearing aids are tried. One after another is used and tested, until the experts are sure they have found just the one that will be of maximum assistance to that particular individual. Then the soldier is trained in the use of that hearing aid.

FOR DEAF SOLDIERS—The soldier on the left is having a cast of his ear made so that the hearing aid he is to use will fit exactly. Col. M. R. Mobley, chief of the Service for the Rehabilitation of the Deafened and Hard of Hearing at Deshon is shown on the right, using one of the testing machines. The soldier smiles because he knows deafness has not hurt his sense of balance. This was shown by the fact that he fell and was caught by the soldier standing ready. Had his balance mechanism been damaged, the electric test would have had no effect.

Goes to School

But in the meantime, the soldier goes to school. There he learns lip reading to help him get the most out of what hearing he has, to enable him to carry on conversation even though he may be totally deaf. Speech correction teachers also give him lessons so that he need never develop that flat or unmusical way of speaking so often characteristic of people who cannot hear themselves talk. He is given vocational guidance and training, if necessary, to help him find and fit himself for the kind of job in which his deafness will not be a handicap.

For the blinded, comparable facilities are set up. It is recognized that a blinded soldier is likely to be terribly depressed. He faces a personal tragedy rare among civilians. There are many blind persons among civilians, of course, but most of them either were blind from childhood and long accustomed to getting along without vision, or else lose their vision gradually in old age when it does not so completely and suddenly disrupt their lives.

Begin Training Early

Because the emotional strain of loss of sight is so serious, Army physicians are particularly anxious to begin the special training of the blinded as soon as possible. Even before they reach the two centers set up for the blind, a representative of the center visits them in the receiving hospital. This representative is peculiarly qualified to advise and encourage the men. He is an officer who was himself blinded in combat and is a "graduate" of the Army special training.

The centers for the blind are at Val-

ley Forge General Hospital, Phoenixville, Pa., and Letterman General Hospital, San Francisco, Calif. At these centers, like those for the deafened, an expert staff is available for treating ordinary wounds as well as any sort of condition causing partial or total blindness. There are also teachers, some of whom are blind and some seeing persons.

Each blind soldier is provided with a Braille watch and cards so that he can play games. The blind teachers instruct him in how to do things for himself—how to part his own hair, how to find his way around, how to tie his necktie. They teach him how to use a cane, not by tapping it along like an old cripple, but as a swagger stick, and how to use it as a personal locator to locate obstacles by listening for the echoes. The teachers who see can offer critical suggestions—notice whether the soldier has gravy on his lapel and whether his tie is in the middle. They show him how to keep his carriage erect and soldierly, how to avoid the slouch that sometimes affects the man who never sees himself in a mirror.

DEAF TEACH THE DEAF—Besides instructing deafened soldiers at Deshon Hospital, Butler, Pa., to read lips, this instructor boosts their morale, for her own experience shows that deafness need not interfere with work.

Teachers in the Army Schools for the blind are enthusiastic about their work. It is heartening to see how the men change in the few weeks they are there. They come in depressed, discouraged, feeling that life is all over for them. They go out different men—are ready to face life. They have found out how to take care (*Turn to next page*)

Every Tissue

in every organ requires proteins to maintain the integrity of its structure and its functions. Unless the RIGHT KIND of proteins is supplied in the daily diet, the organism draws upon its own substance, literally consumes itself.* The proteins of meat are of the right kind, of highest biologic value, adequate for every requirement.

*Samson Wright states ". . . it is impossible to maintain nitrogen equilibrium on diets which are deficient in the essential amino acids, no matter how much protein is consumed . . ." (Applied Physiology, Seventh Edition, page 691; Oxford Univ. Press, New York 1941) . . . According to Macleod the body, in the absence of an adequate amount of exogenous essential amino acids, may be compelled to break down a large quantity of tissue protein to obtain therefrom the contained small amount of a vitally needed amino acid (Macleod's Physiology in Modern Medicine, Ninth Edition, page 791; C. V. Mosby Co., St. Louis 1941).

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The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

AMERICAN MEAT INSTITUTE

MAIN OFFICE, CHICAGO . . . MEMBERS THROUGHOUT THE UNITED STATES

Do You Know?

All of the well-known British fighting *planes* contain North American wood.

United States *railroads* rolled up about 85,000,000,000 passenger-miles in 1943.

The dried toothed *tongue* of the upper Amazon paiche, a large fish, is used as a grater in preparing foods.

California in 1942 had its largest *mineral* production since 1929; in value petroleum ranked first, cement second, gold third.

Cattail floss has many of the qualities of kapok and is useful in life belts and floats, heat and sound insulators, and as filling for cushions.

A pastry *flour* now used in Switzerland contains 50% dried fruit, the rest being wheat flour, fruit and other sugars, nuts and skim milk.

Nail-making in colonial days was largely a home industry; farmers and families hammered out nails as a profitable way to spend long winter evenings.

Iron and copper, which build up the hemoglobin content of the *blood* and prevent or remedy nutritional anemia, are easily obtained from eating most fish.

Common *milkweed* plants, long regarded as a farm weed pest, are now furnishing floss for lifebelts, marine mattresses, and for heat and sound insulation.

The President of Brazil recently presented the United States armed forces with 400,000 bags of *coffee* valued at $5,000,000 as a gift from the people of Brazil, a token of good-will.

Coal supplies 55% of all United States mechanical energy, powers 95% of railroad locomotives, generates 55% of the electricity, heats four out of every seven homes, and is essential in the making of all steel.

The *artificial drying* of grass by electricity, instead of by usual hay curing methods, is said to be a growing practice; the grass is cut earlier than when cut for hay because then the proteins and other nutritive values are higher.

From Page 107

of themselves, how to make a living, how to write letters by using touch typewriting, how to sign their names to checks and letters.

Fortunately a number of the soldiers coming to the vision center for training want to work on a farm when they leave the Army. It is easy, officials have found, to train sightless men to take care of a farm. And chicken raising is the easiest job to teach a blind man to do. They are not taught the traditional jobs for the blind such as chair caning. They learn to make their way in the regular workaday world.

Any deaf or blind soldier may go to one of these special centers. Those becoming deaf or blind in the United States may be sent by any of the general hospitals to one of the centers.

Any soldier who is deafened or blinded may request physicians at his hospital to send him to the special center. He doesn't have to wait for his other wounds to heal; those can receive expert care at the center, too. If he needs a hearing aid, the physicians at the hospital are required to comply with such a request. Or the soldier may write to the Surgeon General's office in Washington, D. C., and officials there will help him to get to the center for treatment and training.

So far, officials do not know how great the proportion of hearing and vision injuries will be. It is undoubtedly true that block buster bombs, dive bombers and all the other noise makers of this war are increasing the number of hearing injuries. Blindness cases are also increasing. But how this number compares with all the other types of injury encountered in combat is not yet known. The ratio does not seem to be at all alarming, but it is large enough to warrant this special care.

Science News Letter, February 12, 1944

MEDICINE

Penicillin Saves Life

Little girl dying from gas gangrene, which persisted even after broken arm was amputated, has remarkable recovery after mold-chemical treatment.

➤ THE MIRACULOUS recovery, thanks to penicillin, of a seven-year-old girl who was dying of gas gangrene is reported by Dr. W. B. McKnight, Dr. Richard D. Loewenberg and Dr. Virginia L. Wright, of Portola, Calif. (*Journal, American Medical Association,* Feb. 5)

Far from the battle fronts, where gas gangrene is an expected if dreaded complication of wounds, on the porch of her home in the High Sierra region of California, this little American girl was found lying with a broken left forearm. How the accident occurred is not known. She was taken immediately to a hospital where, in spite of treatment with sulfathiazole and injections of tetanus antitoxin, gas gangrene developed and her arm had to be amputated. Even then the gangrene continued to threaten her life.

"As a last resort penicillin was given after all hope had been abandoned for a recovery, which came like a miracle," her physicians report.

The penicillin in sufficient quantities to treat the patient successfully was obtained from Dr. Chester Keefer, in charge of penicillin investigations for the National Research Council and the Office of Scientific Research and Development, who recommended that it be provided from a supply assigned to be used in clinical investigation.

At the time the little girl was treated, no trials of penicillin in human cases of gas gangrene had been reported, though laboratory tests had shown it extremely potent against this infection. Recent reports via England of experiences on the North African and Sicilian fronts indicated that it was successfully used on wounded men with gas gangrene.

The condition is comparatively rare in civilian life. Only one other case, a fatal railroad injury, has occurred in the High Sierra region in the last 10 years.

Science News Letter, February 12, 1944

INVENTION

Infra-Red Rays Bake Bread Better and Faster

➤ BETTER loaves in less time is the claim advanced on behalf of a novel bread-baking machine that uses infra-

red rays instead of the ages-honored oven heat. U. S. patent 2,340,354 has just been granted on this device, to Franklin H. Wells of Hackensack, N. J.

Individual pans containing the dough are slowly carried on an endless chain past batteries of adjustable reflector-equipped lamps of the type already in common use in paint-drying and enamel-baking machines. Since infra-red rays are more penetrating than ordinary heat, baking begins in the heart of the loaf practically as quickly as it does on the surface, and the process proceeds more evenly throughout. Savings of from 20% to 30% over customary baking times are claimed by the inventor. Smoother crust is another advantageous feature, he states.

Rights in the patent have been assigned to the American Machine and Foundry Company.

Science News Letter, February 12, 1944

MILITARY SCIENCE

Mountain Fighting Calls Hooves Back to Service

See Front Cover

➤ WARFARE of the future will be entirely mechanized, all experts prophesied in the mid-'thirties. Everything was to move on wheels or tractor treads; gone forever were the picturesque army mule and the dashing cavalry horse.

But when the imagined future became the grim and stony present, military men began to discover that hooves could still go where not even a jeep could quite make it. In the rugged terrains of Tunisia, Sicily, South Italy, it was found necessary to improvise cavalry for a good deal of patrol work, and to purchase pack animals for getting heavy weapons, ammunition and supplies up to the otherwise inaccessible fighting fronts. Fortunately for us, Sicily has long been one of Europe's chief mule-breeding centers, so that a fairly good supply of animals could be purchased.

The front cover picture of this SCIENCE NEWS LETTER was taken by an Army Signal Corps photographer "somewhere in Italy." The mule in the foregound is carrying one of the most formidable weapons of the "front-line artillery," an 81-millimeter mortar. Evidently mules are mules in any language, to judge from the amount of persuasion it takes to keep these newly acquired allies of ours moving.

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MEDICINE

Speedy TB Diagnosis

➤ SPEEDY diagnosis of tuberculosis, within 12 to 24 hours, is possible with a new tuberculin test developed by Dr. H. J. Corper, head of the research department of the National Jewish Hospital in Denver, an announcement from the hospital states.

Use of a transparent adhesive for applying the tuberculin to the skin makes it possible for the physician to watch the reaction. This transparent adhesive also eliminates the danger of apparent "positive" reactions due to sensitivity to adhesive rather than to tuberculin.

The tuberculin used in the test is described as a pure simple tuberculin called "autolytic." It is uncontaminated by the medium on which the tubercle bacilli are grown and in which all live bacilli are killed by toluene and removed.

The Spark that Lights the Flame of Victory

A pinpoint of fighting metal placed in the arc of the spectrograph writes its own signature on a photographic plate. Inside the instrument, the light from that flame is broken up by a prism as a prism breaks up sunlight. Each element identifies itself by a series of characteristic lines, always the same for the same basic element. It reveals to the spectrographer each constituent, what impurities are present and in what quantities.

Thus spectrography helps in control and inspection. It keeps tough fighting steels tough, helps in development of new fighting metals. Spectrography is used, too, in other fields to speed research and analysis . . . chemicals, foodstuffs, vitamins.

Because Bausch & Lomb had long experience with such precision optical equipment, it was ready for quantity production of gunfire control instruments, binoculars and aerial photographic lenses. When the last gun is fired, Bausch & Lomb will devote its enlarged experience to peacetime optical production.

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As a result, this tuberculin developed by Dr. Corper is said for the first time to eliminate all danger that a patient's reaction to foreign elements in the tuberculin might mistakenly be diagnosed as indicating tuberculosis. Danger of the patient suffering any local or general reaction to the tuberculin is also removed.

The test, Dr. Corper points out, should not be considered an exclusive test for the disease, but an inclusive one to verify medical findings. He believes it ranks among the best biologic diagnostic tests developed. It has been used successfully for the past several years at the Fitzsimmons General Hospital, Denver, and the University of Colorado School of Medicine, as well as at the National Jewish Hospital.

Science News Letter, February 12, 1944

BIOCHEMISTRY

Germ-Killing Substances Found in Onion Oils

➤ APPARENT support for an old folk-belief that onions, garlic and their strong-scented kin-vegetables are "good for what ails you" is offered by the reported discovery, by Prof. B. P. Tokin of the University of Tomsk, USSR, that their essential oils contain substances that kill bacteria, protozoa and even larger organisms like yeast cells and the eggs of certain lower animals. The report is contained in a bulletin of the USSR Society for Cultural Relations with Foreign Countries, which has just been received in the United States.

Prof. Tokin has given the name "phytoncides" to the substances he has isolated. Experimental use in hospitals is now being made of these compounds, particularly in the treatment of suppurative wounds.

Science News Letter, February 12, 1944

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AGRICULTURE

NATURE RAMBLINGS by Frank Thone

Hidden Furrows

➤ PLOWING in the traditional pattern, with long, straight furrows of cleanly-turned soil lying dark in the sun, is under challenge. Newer methods of preparing the soil, that loosen it enough for seeding but leave stubble and litter on the surface, are being strongly advocated as better for water conservation and for erosion prevention.

Critical tests of these new methods are being made at the Iowa Experiment Station at Ames, Iowa, and at the demonstration area of the U. S. Soil Conservation Service near Clarinda. These tests measure values in terms of costs per bushel in man-hours and horsepower-hours put in by the farmer and his tractor, as well as the conventional bushels-per-acre reckoning commonly used. First results are summarized, in some detail, in the professional journal, *Agricultural Engineering* (January), by a three-man research team: Prof. E. V. Collins of Iowa Agricultural Experiment Station, and R. A. Norton and G. M. Browning of the U. S. Soil Conservation Service. They also summarize earlier investigations by themselves and other workers. (*See SNL*, Nov. 7, 1942)

Three principal types of tillage implements have been used by experimental-minded farmers who are trying to get away from the moldboard plow. One is the disk harrow, advocated especially by Edward J. Faulkner in his recent book, *Plowman's Folly*. This is already familiar, although its use as an exclusive means of tilling the soil seems radical to most farmers.

A second implement is the subsoil lister, which is a type of plow that lifts and loosens the soil, but lets it drop into place again without turning it completely over as a moldboard plow does. The third implement, called sometimes a subsoil tiller, sometimes a sweep, is a widely V-shaped blade that is drawn along entirely below the surface. It stirs the soil underneath but disturbs the surface, with its cover of stubble and litter, even less than the lister does.

Tests of all three of these implements, on three different soil types, have been run, principally with corn, though soybeans and other field crops were also tried to some extent. In general, fields prepared for planting by the new methods yielded as much, or nearly as much, per acre as comparable fields plowed in the conventional way. Differences were greatest in heavier soil, especially when wet. In lighter, drier soil the difference was sometimes in favor of the newer tillage method, especially where contour rather than straight-row cultivation was carried out.

In all cases, the newer methods required materially lower costs in man-hours and tractor power (and hence fuel and oil), so that lower yields per acre were at least partly offset. Moreover, the usually unreckoned but nevertheless serious costs in water loss through runoff and soil loss through erosion were far less, especially on rolling land where contouring or terracing was used, in the case of the newer tillage methods.

Objection has been raised to tillage methods that leave the surface relatively undisturbed, on the score that it would encourage weediness. The three researchers feel that further evidence on this point is needed before a positive verdict can be rendered. In at least one instance, plots that had been subsurface-tilled for corn the previous year and then plowed and planted to soybeans in 1943 were less weedy than similar plots that had been prepared for both crops by plowing. This, however, was an accidental discovery, and further investigation of this problem is considered necessary.

Akin to the weed problem is the insect pest problem. The area of European corn-borer infestation has now reached central Iowa. Corn-borer larvae live through the winter largely in corn stubble. Other insect pests also shelter in surface litter. Clean plowing in the spring has been considered the best method of control. If clean plowing is to be given up in favor of any of the newer tillage methods, this also is something that calls for further research.

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Books of the Week

➤ ANIMALS, from carrier pigeons to the camels that any soldier would walk a mile to get away from, are the theme of ANIMAL REVEILLE, by Richard Dempewolff. (*Doubleday, Doran*, $3) The text is brisk, chatty, anecdotal; the photographic illustrations informative and often dramatic.

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➤ SALAMANDERS, those long-bodied, long-tailed relatives of frogs that too many of us are apt to classify as "a kind of lizard", receive their adequate zoological dues in Sherman C. Bishop's new HANDBOOK OF SALAMANDERS. (*Comstock*, $5) All known species of the United States, Canada and Lower California are thoroughly described in both appearance and life habits. The text is helpfully supplemented with halftone illustrations (mostly from living specimens) and distribution maps.

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Just Off Press

AIR ACROBATICS ARE EASY—D. J. Brimm, Jr.—*McGraw-Hill*, 133 p., illus., $2.50.

DAVID DALE OWEN: Pioneer Geologist of the Middle West—Walter Brookfield Hendrickson—*Indiana Hist. Bur*, 180 p., illus., $2.

INTRODUCTION TO EXCEPTIONAL CHILDREN—Harry J. Baker—*Macmillan*, 496 p., illus., $3.50. College textbook devoted to problems of physically, mentally and emotionally handicapped children.

MAURICE ARTHUS' PHILOSOPHY OF SCIENTIFIC INVESTIGATION—translated from the French, introduction by Henry E. Sigerest and foreword by Warfield T. Longcope—*Johns Hopkins*, 26 p., 75c.

SAN FRANCISCO BAY AS A FACTOR INFLUENCING SPECIATION IN RODENTS—Emmet T. Hooper—*Univ. of Mich. Press*, 94 p., illus., $1.25, paper, Misc. Pub. No. 59.

SELECTED FILMS: Biological and Physical Sciences in Schools of Nursing—Loretta Heidgerken—*Educ. Film Lib. Assn.*, 37 p., 50c., paper.

A SYSTEMATIC REVIEW OF THE NEOTROPICAL WATER RATS OF THE GENUS NECTOMYS (CRICETINAE)—Philip Hershkovitz—*Univ. of Mich. Press*, 102 p., illus., $1.15, paper, Misc. Pub. No. 58.

VITALIZED FUNDAMENTALS OF ELECTRICITY—Robert H. Carleton—*College Ent. Book Co.*, 192 p., illus., 45c, paper.

VITALIZED FUNDAMENTALS OF MACHINES—Robert H. Carleton—*College Ent. Book Co.*, 192 p., illus., 45c, paper.

WHAT TO DO WITH GERMANY—Louise Nizer—*Ziff Davis*, 213 p., $2.50. An attorney concerned with international problems prescribes treatment for after the war.

There is an opening for a young man or woman who can produce science teaching aids for a large industrial concern. The material to be prepared—booklets, charts, manuals, visual aids, motion picture guides, etc.—would be used in junior and senior high schools. This person should have done some science teaching, physical sciences preferred, and had some writing experience, the more the better. It is a full time, permanent position. You suggest the salary. School Manager, Box 1017, Pittsburgh 30, Pa.

MEDICINE

Yale Gets Collection Of TB Germ Chemicals

➤ HUNDREDS of chemicals isolated from living tuberculosis germs in research that started in 1927 and is still continuing have found a permanent home at Yale University, where most of them were isolated. The chemicals were presented to the University as a permanent collection by the National Tuberculosis Association which sponsors the research in the hope of finding a chemical cure for tuberculosis through probing the secrets of the germ's own chemistry.

A poisonous sugar; a poisonous protein; a unique acid, phthioic acid, found only in tuberculosis germs and possessing special biological properties probably due to its unusual chemical structure; and phthiocol, yellow crystals which give the tuberculosis germ its reddish-brown color, are among the nearly 400 chemicals already isolated by Prof. R. J. Anderson and associates. Although Prof. Anderson expects to continue his studies, the collection will furnish other students of the problem full information on the work to date.

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Layers of cellulose acetate film covered with layers of metal foil on which are coatings of a water-proof bituminous material, and outer coverings of kraft paper, protect *Books of Scripture* included in life-raft equipment.

SCIENCE INFORMATION

for Members of the Armed Forces OVERSEAS

IN order to serve the armed forces, Science News Letter recently offered its new monthly Overseas Edition to men and women outside the United States.

This special edition is geared to the armed forces—it contains scientific information interesting and useful to them. News important to us here, but not to them there, is cut out in order to pack the Overseas Science News Letter with the science information of greatest interest and use to members of our armed forces Overseas.

It is just sixteen pages (like the Science News Letter you are reading), but it is pocket size, printed on Air Mail weight paper, and the pictures and types are one-third smaller than the regular weekly edition. It is mailed by FIRST CLASS MAIL to service people Overseas each month, for $1.25 per year.

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O-833

•New Machines and Gadgets•

❁ *FIELD demineralizing units prepared particularly for the Army produce the equivalent of distilled water for storage batteries and other purposes. In operation, first the chlorides, sulfates and bicarbonates in the water are converted into acids, then these are absorbed by a special agent, except the carbonic acid, which is converted into water and carbon dioxide.*

Science News Letter, February 12, 1944

❁ *GRANULATED plastic pellets are used by the Army Air Forces to remove carbon from aircraft engine pistons. The pellets, shown in the photograph, are blown by sand-blasting equipment against the piston sides and ring grooves. Carbon is knocked off and the surface polished without any abrasion.*

Science News Letter, February 12, 1944

❁ *SURFACE temperatures in the heat treatment of metals are easily noted by the use of chalk-like marks made on them with special crayons that melt at varying specific temperatures. The mark remains unchanged as the surface temperature of the object increases until its critical temperature is reached, when it melts instantly into a liquid streak.*

Science News Letter, February 12, 1944

❁ *SMALL troughs holding water placed under seed-bed boxes in greenhouses supply sufficient moisture to the soil in the boxes for the germination of the seeds and for the young plants. Burlap or fiber glass wicks extending from the water through the bottom of the box into the soil draw the water up by capillary action.*

Science News Letter, February 12, 1944

❁ *AUTOMOBILE air-cooling apparatus, recently patented, consists of a refrigerating unit placed in the engine compartment between the radiator and the outside protecting grill. It cools water, or some other suitable liquid, which is piped to cooling coils under the driver's seat. The cooled air is delivered through the ducts on the rear of the seat.*

Science News Letter, February 12, 1944

❁ *ANOTHER coffee-maker, now patented, brews the coffee in a partial vacuum to retain its full flavor. Coffee and water partly fill a glass container to which is fitted a stopper with a valve through which the hot air can escape. When boiling begins, the heat is turned off, the valve automatically closes and the contents are allowed to simmer for five minutes.*

Science News Letter, February 12, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 194.*

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